P A T E N T C L A I M S

1. Sleeve with multiple layer construction for printing presses having king rolls designed as air cylinders, with an inner tube of reversibly expandable plastic material, the inner diameter of which is smaller than the outer diameter of the king roll, with an elastic, compressible intermediate layer that accommodates the radial expansion of the inner tube during mounting or dismounting of the sleeve, and with an outer layer, **characterised in that** a support structure is integrated into the sleeve construction between inner tube (1, 101) and outer layer (3, 103), which completely penetrates the compressible intermediate layer (2, 102) in at least one location in the radial direction and stabilises the outer layer (3, 103) relative to the inner tube (1, 101) in the circumferential direction and/or the radial direction.

2. Sleeve in accordance with Claim 1, **characterised in that** the support structure consist of a number of radial struts distributed circumferentially in a symmetrical manner.

3. Sleeve in accordance with Claim 1, **characterised in that** the support structure includes or consists of rings (5, 105) concentrically surrounding the inner tube (1, 101).

4. Sleeve in accordance with one of the Claims 1 to 3, **characterised in that** the compressible layer (2, 102) is intermitted by radial holes or by concentric, ring-shaped recesses, which preferably are turned recesses, wherein the support structure (5, 105) is provided in the radial holes or recesses and partially bridges the compressible layer (2, 102).

5. Sleeve in accordance with one of the Claims 1 to 4, **characterised in that** a single ply or multiple ply transition

layer (109) of a plastic material of low density is provided between the outer layer (103) and the compressible intermediate layer (102).

6. Sleeve in accordance with one of the Claims 1 to 5, **characterised in that** the outer layer consists of a plastic material of low density.

7. Sleeve in accordance with one of the Claims 1 to 6, **characterised in that** the transition layer and/or the outer layer consists of a material that can be cast or foamed.

8. Sleeve in accordance with one of the Claims 2 to 7, **characterised in that** the rings or radial struts consist of the same material as the material of the transition layer or the material of the bottom-most ply of the transition layer and preferably can be formed at the same time as the transition layer is foamed or cast.

9. Sleeve in accordance with one of the Claims 1 to 7, **characterised in that** the rings (5) or radial struts consist of the same material as the outer layer (3) and preferably is formed during casting or introducing of the outer layer (3).

10. Sleeve in accordance with one of the Claims 1 to 7, **characterised in that** the rings consist of metal, a thermoplastic or a thermosetting plastic and are preferably implemented in a number of parts.

11. Sleeve in accordance with one of the Claims 1 to 7, **characterised in that** the rings or radial struts consist of a plastic material introduced into the recesses or radial holes, such as a cast or filler mass, or similar.

12. Sleeve in accordance with one of the Claims 1 to 11, **characterised in that** the rings (5, 105) or radial struts of

the support structure are formed at a distance (A) from both end faces of the sleeve (10, 110).

13. Sleeve in accordance with one of the Claims 1 to 12, **characterised in that** the intermediate distance between two rings (105) or locations of radial struts does not exceed a predefined dimension of preferably 500 mm.

14. Sleeve in accordance with one of the Claims 1 to 13, **characterised in that** partial depressions (6) are formed on the inner circumference of the inner tube (1), where preferably the axial length (L) of the depressions is greater than the axial width (B) of the support structure formed radially aligned with the depression (6) on the outer surface of the inner tube (1).

15. Sleeve in accordance with Claim 14, **characterised in that** the depression (6) consists of circumferential grooves and the support structure includes concentric rings (5).

16. Sleeve in accordance with Claim 14 or 15, **characterised in that** the depth (W_i) of the depression(s) (6) on the inner tube (1) is greater than the outer diameter (D) of the king roll by a small clearance.

17. Sleeve in accordance with one of the Claims 1 to 16, **characterised in that** the sleeve is an adapter or transition sleeve on which a printing sleeve or similar can be installed.

18. Sleeve in accordance with one of the Claims 1 to 17, **characterised by** an conductive or diverting outer layer or surface coating, and an electroconductive or diverting element, which connects the outer layer or surface coating at the inner circumference of the inner tube with the king roll outer wall for diverting electrostatic chargings into the king roll.

19. Sleeve in accordance with Claim 18, **characterised in that** the element comprises a variable length in the radial direction.

20. Sleeve in accordance with Claim 18 or 19, **characterised in that** the element is arranged in the region of the support structure and/or is integrated into the means forming the support structure, such as, in particular, rings or radial struts and/or is installed inside these means.

21. Method for the manufacture of a sleeve with a multiple layer structure for printing presses with king rolls designed as air cylinders, with the steps manufacturing of a reversible, elastic inner tube, applying a compressible intermediate layer on the outer surface of the inner tube, and applying a single or multiple ply transition layer of a low density material that can be cast or foamed, and/or applying an outer layer **characterised in that** recesses or radial holes are formed in the compressible intermediate layer (2, 102) before the applying of the transition or outer layer (3, 109), which are filled with the material of the transition or outer layer when these are applied, or with an additional material, whereby a ring-shaped or web-shaped support structure is formed in the sleeve, which stabilises the outer layer (3, 103) relative to the inner tube (1, 101) in the circumferential and/or radial direction.

22. Method in accordance with Claim 21, **characterised in that** during manufacture, in particular during the winding of the inner tube (1), depressions (6) are formed on the inner circumference of the inner tube (1) and that the recesses or radial holes are arranged with the depressions radially aligned in the compressible layer (2).